
फ्लूक्लोरालिन टी. सी. — विशिष्टि
(पहला पुनरीक्षण)

**Fluchloralin Technical
Concentrates — Specification**
(First Revision)

ICS 65.100.20

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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides Sectional Committee had been approved by the Food and Agriculture Divisional Council.

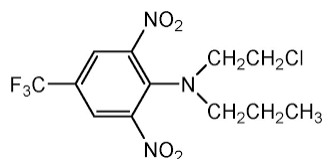
Fluchloralin is a pre-emergence herbicide used selectively in different crops, such as cotton, rice, jute, etc.

Fluchloralin is the accepted common name by the International Organization for Standardization (ISO) for and (2-chloroethyl)-2, 6-dinitro-N-propyl trifluoromethylaniline. The empirical and the structural formulae and the molecular mass of fluchloralin are indicated below:

Empirical Formula



Structural Formula



Molecular Mass

355.7

This standard was first published in 1978. The standard has been brought out in the latest style and format of the Indian Standards, and references to Indian Standards wherever applicable have been updated.

In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is listed in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***FLUCHLORALIN TECHNICAL CONCENTRATES —
SPECIFICATION***(First Revision)***1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for fluchloralin, technical concentrate.

2 REFERENCES

The standards, given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

<i>IS No.</i>	<i>Title</i>
IS 1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)
IS 1260 (Part 2) : 2020	Packaging — Distribution Packaging — Graphical symbols: Part 2 General goods (<i>fourth revision</i>)

<i>IS No.</i>	<i>Title</i>
IS 6940 : 1982	Methods of test for pesticides and their formulations (<i>first revision</i>)
IS 8190 (Part 2) : 1988	Requirements for packing of pesticides: Part 2 Liquid pesticides (<i>second revision</i>)
IS 10946 : 1996	Methods of sampling for technical grade pesticides (<i>first revision</i>)

3 REQUIREMENTS**3.1 Description**

The material shall be in the form of a clear, orange liquid free from extraneous matter. It shall contain only xylene as the main solvent.

3.2 The material shall also comply with the requirements specified in Table 1.

Table 1 Requirements for Fluchloralin, Technical Concentrates
(*Clauses 2.2 and 5.1*)

Sl No.	Characteristics	Requirement	Method of Test, Refer to
(1)	(2)	(3)	(4)
i)	Fluchloralin content, percent by mass, <i>Min</i>	55	Annex A
ii)	Moisture content, percent by mass, <i>Max</i>	0.5	IS 6940
iii)	Acidity (as H ₂ SO ₄) percent by mass, <i>Max</i>	0.2	IS 6940
	or		
	Alkalinity (as NaOH), percent by mass, <i>Max</i>	0.2	IS 6940

4 PACKING

The material shall be packed in clean and dry containers made of mild steel, suitably and properly lacquered from inside. Aluminium containers may also be used. The containers shall also conform to the general requirements stipulated in 2 of IS 8190 (Part 2)

5 MARKING

5.1 The containers shall be securely closed and shall be bear legibly and indelibly the following information:

- a) Name of the material;
- b) Name and address of the manufacturer;
- c) Batch number;
- d) Date of manufacture;
- e) Date of expiry;
- f) Net quantity;
- g) Nominal fluchloralin content, percent (m/m);
- h) Cautionary notice as worded in the *Insecticides Act*, 1968, and Rules framed thereunder; and
- j) Any other information required under the *Legal Metrology (Packaged Commodities) Rules*, 2011.

5.1.1 In addition to the above, the containers shall also be marked with the symbol of danger for poisoning as specified in IS 1260 (Part 1)

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material shall be drawn according to IS 10946.

7 TESTS

7.1 Tests shall be carried out as prescribed in col 4 and 5 of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A
[Table 1, SI No. i)]

DETERMINATION OF FLUCHLORALIN CONTENT

A-1 GENERAL

Either of the two methods, namely, gas chromatographic method and spectrophotometric method may be used for determination of fluchloralin content.

A-2 GAS CHROMATOGRAPHIC METHOD

A-2.1 Principle

The method consists of injecting a sample along with a reference standard in a known proportion with a gas chromatograph and determining the area under each peak. The area under the peak is proportional to the mass of sample. By comparison of this area with that of the standard the percentage purity of the sample is determined.

A-2.2 Apparatus

A-2.2.1 Gas-Liquid Chromatograph

Equipped with a recorder and disc integrator and fulfilling the following conditions:

Column length	2 m
Detector	Thermal conductivity type
Column temperature	230 °C
Injection port temperature	250 °C
Detector temperature	250 °C
Flow rate	50 ml/min
Carrier gas	Helium or hydrogen

A-2.2.2 Column

Consisting of 2.0 m stainless steel (designation 04Cr14Ni10) tubing, of 2.17 mm internal diameter packed with 5 percent silicon XE 60 deposited on chromosorb G-AW-DMCS, 60-80 micron.

A-2.2.3 Micro-Syringe — 10 µl capacity.

A-2.3 Reagents

A-2.3.1 Acetone — Pure by gas chromatography.

A-2.3.2 Standard Reference Fluchloralin

A-2.4 Procedure

A-2.4.1 Preparation of the Solution

Weigh accurately about 1 g to 2 g of fluchloralin, technical sample and dissolve in 10 ml volumetric flask with acetone. Adjust to the mark with acetone.

A-2.4.2 Preparation of the Reference Standard

Weigh accurately about 0.5 g to 1.0 g of the standard and dissolve in 10 ml volumetric flask with acetone. Adjust to the mark with acetone.

A-2.4.3 Analysis of the Sample

Check the chromatograph for thermal and flow equilibrium. Inject 2 µl of standard solution followed by sample solution alternatively at least thrice.

Measure the peak areas with reference to the sample as well as standard and calculate fluchloralin content in the sample.

A-2.5 Calculation

Fluchloralin content, percent by mass

$$= \frac{A \times M \times P}{A_1 \times M_1}$$

where

A = peak area corresponding to fluchloralin sample,

M = mass of fluchloralin sample taken for the test,

P = percentage purity of the standard for the test,

A_1 = peak area corresponding to fluchloralin standard, and

M_1 = mass of fluchloralin standard taken for the test.

A-3 SPECTROPHOTOMETRIC METHOD

A-3.1 Principle

Determination of the active ingredient in fluchloralin can be carried out by using a spectrophotometer.

A-3.2 Apparatus

A-3.2.1 Spectrophotometer

A-3.3 Reagent**A-3.3.1 Methanol****A-3.4 Procedure****A-3.4.1 Preparation of Sample Solution**

Weigh 1 ml of sample solution precisely to the 0.1 mg, transfer the same to a 200 ml volumetric flask, and make up the volume with methanol. Dilute 10 ml of this solution once again to 200 ml with methanol (sample solution B).

A-3.4.2 Preparation of Standard Solution

Weigh accurately about 0.45 g of fluchloralin standard into a 200 ml volumetric flask. Add methanol to dissolve the same and make up to the mark with methanol. Pipette 10 ml of this solution to another 200 ml volumetric flask and make up to the mark with methanol (standard solution B).

A-3.4.3 Analysis

Read spectrum of sample solution B and standard solution B in the ultra-violet region against methanol in a cell path of 1 cm. Measure absorption on an absorbance maximum of 368.5 nm.

A-3.5 Calculation

Fluchloralin content, percent by mass

$$= \frac{A \times M \times P}{A_{std} \times M_1}$$

where

A = observed absorbance of sample solution B,

M = mass of standard taken for analysis,

P = percent purity of standard,

A_{std} = absorbance of standard solution B, and

M_1 = mass of sample taken for analysis.

NOTE — The absorbance values of the standard as well as sample should not differ by more than ± 10 percent.

ANNEX B
(Foreword)

COMMITTEE COMPOSITION

Pesticides Sectional Committee, FAD 01

<i>Organization</i>	<i>Representative(s)</i>
Directorate of Plant Protection Quarantine and Storage, Faridabad	DR RAVI PRAKASH (<i>Chairperson</i>)
All India Biotech Association, New Delhi	SHRI SAURABH SINGHAL SHRI SHAH JI DHAR (<i>Alternate</i>)
Central Insecticide Board and Registration Committee, Faridabad	SECRETARY DR VANDANA SETH (<i>Alternate</i>)
Central Insecticide Laboratory, Faridabad	DR ARCHANA SINHA SHRI SUBHASH CHAUDHARY (<i>Alternate</i>)
Consumer Guidance Society of India, Mumbai	SHRI SITARAM DIXIT DR M. S. KAMATH (<i>Alternate</i>)
Crop Care Federation of India, New Delhi	DR J. C. MAJUMDAR
Crop Life India, New Delhi	SHRI ASITAVA SEN MS NIRUPAMA SHARMA (<i>Alternate</i>)
CSIR -Indian Institute of Toxicology Research, Lucknow	DIRECTOR DR SHEELENDRA P. SINGH
Food Safety and Standards Authority of India, New Delhi	ADVISOR (STANDARDS)
FMC India Pvt. Limited, Bengaluru	SHRI CHIRAG PATEL
IDMA Laboratories Limited, Chandigarh	DR INDRA RAI
Indian Agricultural Research Institute, New Delhi	DIRECTOR
Indian Institute of Packaging, Mumbai	DR TANWEER ALAM
Indian Pest Control Association, New Delhi	SHRI UDAYAN GHOSH
Institute of Pesticide Formulation Technology, Gurgaon	DR M. VAIRAMANI
Ministry of Agriculture, Department of Agriculture, Chennai	JOINT DIRECTOR OF AGRICULTURE (RES) DEPUTY DIRECTOR LAB (<i>Alternate</i>)
National Centre for Integrated Pest Management, New Delhi	DR SUMITRA ARORA
National Institute of Plant Health Management, Hyderabad	DR MAHESH SAINI MS T. SRIDEVI (<i>Alternate</i>)
Pesticide Manufactures and Formulators Association of India (PMFAI), Mumbai	DR ARCHANA SRIVASTAVA DR UDAY KUMAR (<i>Alternate</i>)

<i>Organization</i>	<i>Representative(s)</i>
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In Personal Capacity (4-6-90/2/8/2, Sri Devi Nilayam Tejaswinagar Coloni, Attapur, Hyderabad – 500048)	MR C. V. RAO
In Personal Capacity (263, Sector 28, Faridabad – 121008)	MR VIPIN SAINI
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'E'/ DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary

SHRI KULDEEP MITTAL
SCIENTIST 'B'/ASSISTANT DIRECTOR
(FOOD AND AGRICULTURE), BIS

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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